



Linda S. Adams
Secretary for
Environmental Protection

Air Resources Board

Mary D. Nichols, Chairman
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Sacramento, California 95812 • www.arb.ca.gov



Arnold Schwarzenegger
Governor

January 7, 2009

Mr. Wilson Chu
Marketing and New Business Manager
Johnson Matthey
Diesel Emission Control Systems
380 Lapp Road
Malvern, Pennsylvania 19355

Dear Mr. Chu:

The Air Resources Board (ARB) has reviewed the Johnson Matthey Inc. application for the verification of the CRT(+) diesel particulate filter (DPF). Based on the evaluation of the data provided, the ARB hereby verifies that the CRT(+) DPF reduces emissions of diesel particulate matter (PM) by 85 percent or greater and does not increase nitrogen dioxide (NO₂) emissions beyond the 2009 limit of 20 percent of the baseline oxides of nitrogen (NO_x) emissions (Level 3 Plus) when in use in stationary emergency standby (E/S) generators powered by Tier 1, Tier 2, or Tier 3 certified off-road engines meeting 0.2 grams per brake horse power hour (g/bhp-hr) diesel PM or less based on certification or in-use emissions testing. The executive order (EO DE-08-009) for the CRT(+) DPF, including a list of the applicable engine families is enclosed.

The required emissions and durability testing of the CRT(+) DPF were performed per the first 504 hours of the testing protocol entitled "CRT(+) Verification Application," as approved by ARB. As a part of the required testing, 504 hours of durability testing, including 144 cold starts, were completed on the system without a reduction in the effectiveness of the system, making the system eligible for stationary emergency standby verification.

Since the durability testing performed to date is more than one third of the 1000 hours required for conditional verification for stationary prime generator application, the CRT(+) DPF is, therefore, granted conditional verification as a Level 3 Plus diesel emission control device for stationary prime generators powered by Tier 1, Tier 2, or Tier 3 certified off-road engines meeting 0.2 g/bhp-hr diesel PM or less based on certification or in-use emissions testing. The conditional verification does not receive an executive order and must be completed within one year after receiving conditional verification. If these conditions of verification are not satisfied by the aforementioned

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California Environmental Protection Agency

time period, the verification is automatically terminated. For the aforementioned time period, conditional verification is equivalent to verification for the purpose of satisfying the requirements of in-use emission control regulations.

The verification is valid provided the following operating criteria are met:

Parameter	Value
Application	Stationary Emergency Standby Power Generation
Engine Type	Diesel, with or without turbocharger, without exhaust gas recirculation (EGR), mechanically or electronically controlled, Tier 1, Tier 2, or Tier 3 certified off-road engines meeting 0.2 g/bhp-hr diesel PM or less based on certification or in-use emissions testing.
Minimum Exhaust Temperature for Filter Regeneration	The engine must operate at the load level required to achieve 240 degrees Celsius (°C) for a minimum of 40 percent of the engine's operating time and an oxides of nitrogen (NOx)/PM ratio of 15 @ $\geq 300^{\circ}\text{C}$ and 20 @ $\leq 300^{\circ}\text{C}$. Operation at lower temperatures is allowed, but only for a limited duration as specified below.
Maximum Consecutive Minutes Operating Below Passive Regeneration Temperature	720 minutes
NOx/PM Ratio Requirements	NOx/PM ratio of at least 8 with a preference for 20 or higher.
Number of Consecutive Cold Starts and 30 Minute Idle Sessions before Regeneration Required	24
Number of Months of Operation Before Cleaning of Filter Required	6 to 12 depending on hours of operation, maintenance practice, and oil used.
Fuel	California diesel fuel with less than or equal to 15 ppm sulfur or a biodiesel blend provided that the biodiesel portion of the blend complies with ASTM D6751, the diesel portion of the blend complies with Title 13 (CCR), sections 2281 and 2282, and the blend contains no more than 20 percent biodiesel by volume.
Verification Level	Level 3 Plus Verification: <ul style="list-style-type: none">• PM - at least 85% reduction• NO₂ - meets January 2009 limit

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Since there may be significant variations from application to application, Johnson Matthey Inc. must review actual operating conditions (duty cycle, baseline emissions, exhaust temperature profiles, and engine backpressure) prior to retrofitting an engine with an CRT(+) DPF to ensure compatibility. The product must not be used with any other systems or engine modifications without ARB and manufacturer approval.

Furthermore, the engine on which the CRT(+) DPF is installed should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer. Johnson Matthey Inc. must install the CRTdm monitoring device, or equivalent, backpressure monitor on all engines retrofitted with an CRT(+) DPF.

ARB hereby assigns the CRT(+) DPF the designated family name of:

CA/JMI/2008/PM3+/N00/ST/DPF01

This identification number should be used in reference to this verification as part of the system labeling requirement. Labels attached to the CRT(+) DPF and the engine must be identical.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, Johnson Matthey Inc. is responsible for honoring their warranty (California Code of Regulations, Title 13, section 2707) and conducting in-use compliance testing (California Code of Regulations, Title 13, section 2709).

The conditional verification for stationary prime generator applications is subject to the same operating criteria as the verification for stationary E/S generators and the full verification requirements must be completed within one year.

Should you have any questions or comments, please contact Mr. John Lee, Air Resources Engineer, at (916) 327-5975 or Mr. Kirk Rosenkranz, Air Pollution Specialist, at (916) 327-7843.

Sincerely,

/s/

Robert D. Fletcher, Chief
Stationary Source Division

Enclosure

cc: See next page.

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cc: John Lee
Air Resources Engineer

Kirk Rosenkranz
Air Pollution Specialist